

A VARIATION OF THE MERCHANT-CROSSLEY SOIL MICROARTHROPOD EXTRACTOR

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The Merchant-Crossley extractor is an inexpensive apparatus which rivals more elaborate constructions in efficiency (Merchant and Crossley, 1970; Seastedt and Crossley, 1978). The design suggested here involved modifications to improve ease of operation and to minimize lateral contaminations. As in the original, the 2 inch diameter soil corer used is commercially available from "Art's Machine Shop" (Harrison and Oregon Trail, American Falls, Idaho 83211) and costs slightly more than \$100 (U.S.). The steel sampling cup can be ordered to any length, as can the aluminum retaining cylinders.

Soil cores taken in the field are trimmed at the bottom end, placed in individual plastic bags, left open at the top, and kept in an ice-chest until extraction. The top of each retaining cylinder, with the core intact, is covered with a small individual fiberglass screen. It is cut slightly larger than the cylinder and held in place by a plastic retaining-cylinder cover (also available from "Art"), from which most of the center has been cut out so that little more than a "lip" is left to hold the screen in place. This soil-cylinder-screen unit is then inverted, placed into the extractor hole from below, and held up by two heavy rubber bands, wrapped around the upper part of the cylinder.

The extractor itself is constructed from varnished 1/2" plywood. I have found the most convenient design to be that shown in the accompanying figure. Heat is provided by 7 watt "nite-lite" bulbs, either used in a Christmas tree string, or preferably individually wired "cleat receptacles" attached to the extractor cover. Individual tin or aluminum (12 oz.) cans (with both ends cut out) between the top and core provide reflection and maintain heat. Due to the individual nature of each unit, there is no "edge-effect" in terms of extraction efficiency, as there often is with extractors using a common heat source. Because of the low wattage of each 20-unit extractor, an inexpensive household dimmer-switch can be wired and attached to the outside of the cover for the control of light intensity.

The extractor is very adaptable in terms of collection method. As in the original version, collection into alcohol can be accomplished with the use of powder funnels forced through holes cut into caps of collecting vials. Vials are about 1/3 filled, so that room is left for the funnel which is rinsed with alcohol after extraction is complete.

If extraction over water is preferred, appropriate size plastic jars are used instead of the powder funnel-vial unit. An ideal, inexpensive screw-cap plastic jar is a 4 1/2 oz. wide-mouth specimen-container used in hospitals (Superior Plastic Products Corp., P.O. Box 2128, Providence, RI 02905). The cap (with the center cut out to the diameter of the cylinder cap) is attached to the underside of the middle layer of the extractor, so that the jar (1/3 filled with water) can be screwed in from below. An effective, and very inexpensive canister extractor is

the result. It prevents drying of the core from below, and eliminates the use of funnels, which provide condensation surfaces and allow potential escape. Seastedt and Crossley (1978) had somewhat poorer results with a canister-style apparatus, but this was probably due to their use of alcohol, instead of water, as a collecting fluid.

The compact 20-unit extractors can be removably wall-mounted, shelf-mounted, or placed on small tables; they can even be stacked if side ventilation holes are provided. They can be used in refrigerators or both small and large environmental chambers and are extremely portable.

REFERENCES

- Merchant, V.A. and D.A. Crossley, Jr. 1970. An inexpensive high-efficiency Tullgren extractor for soil microarthropods. *J. Georgia Entomol. Soc.* 5: 83-87.
- Seastedt, T.R. and D.A. Crossley, Jr. 1978. Further investigations of microarthropod populations using the Merchant-Crossley high-gradient extractor. *J. Georgia Entomol. Soc.* 13: 338-344.

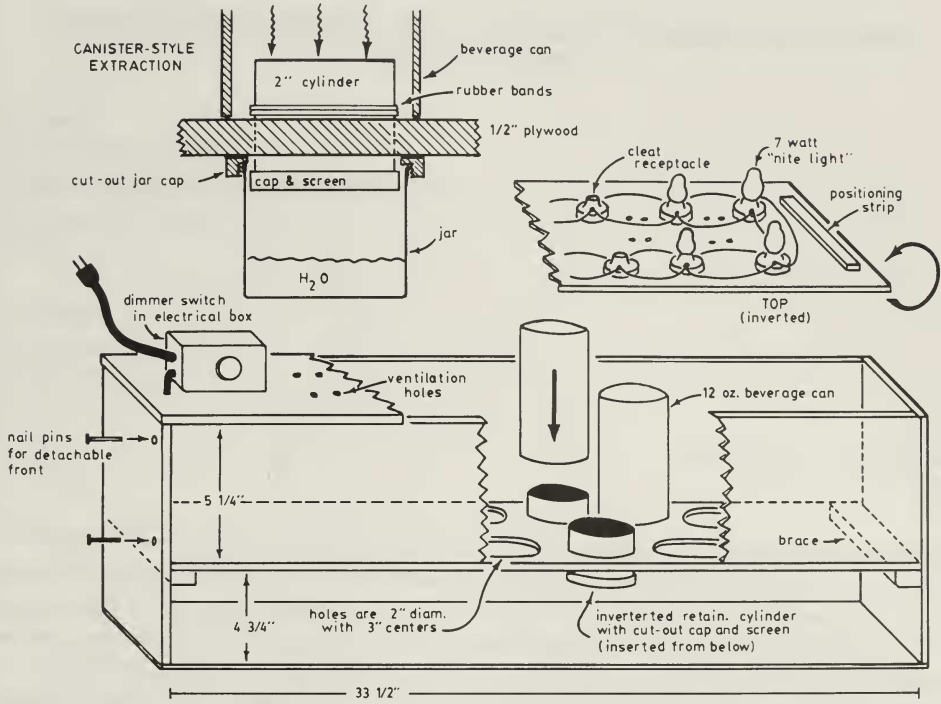


Fig. 1. Diagram of a Modified Merchant-Crossley Extractor for Soil Microarthropods.

